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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/324,304	06/02/1999	ZHENYU WANG	CASE2	1360
46900	7590	10/24/2005	EXAMINER	
MENDELSON & ASSOCIATES, P.C. 1500 JOHN F. KENNEDY BLVD., SUITE 405 PHILADELPHIA, PA 19102			BAYARD, EMMANUEL	
			ART UNIT	PAPER NUMBER
			2638	

DATE MAILED: 10/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	09/324,304		WANG, ZHENYU	
	<b>Examiner</b>		<b>Art Unit</b>	
	Emmanuel Bayard		2638	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_\_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                         |                                                                             |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                                |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____                                                             | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

This is in response to amendment filed on 8/18/05 in which claims 1-47 and 49-52 are pending. The applicant's arguments have been fully considered but they are not persuasive enough therefore this case final. (see Examiner response to arguments below).

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 20-24, 37, 42, 47 and 49-52 are rejected under 35 U.S.C. 102(b) as being anticipated by Morgan et al U.S. Patent No 5,476,488.

As per claim 1, Morgan et al teaches a receiver for identifying a message based upon a received signal, the receiver comprising: a processor that generates a minimum threshold and a maximum threshold (see figs. 1, 6 element 120 and 280 and col.6, lines 6-15 and col.9, lines 2-20) representing a range for each of a plurality of possible message levels, wherein the sizes of the ranges are different for at least two of the message levels; and a comparator that identifies the message by comparing the received signal with the generated minimum and maximum thresholds (see figs. 1, 6 element 136 and col.5, lines 62-67 and col.6, lines 2-35 and col.8, lines 28-60).

As per claim 2, Morgan et al inherently includes wherein the minimum and maximum thresholds are a function of an interrelationship between noise and the message level.

As per claim 3, Morgan et al inherently includes wherein the minimum and maximum thresholds are a function of the interrelationship between digital impairment and the message level.

As per claim 4, Morgan et al inherently includes wherein the minimum and maximum thresholds are a function of the interrelationship between coherent noise and the message level.

As per claim 20, Morgan et al teaches a receiver for identifying a transmitted message based upon a received signal, the receiver comprising: a processor for generating a constellation design having a minimum threshold and a maximum threshold for each of a plurality of possible signal levels (see figs. 1, 6 element 120 and 280 and col.6, lines 6-15 and col.9, lines 2-20), the minimum and maximum thresholds for each possible signal level representing a range, wherein the sizes of the ranges are different for at least two of the possible signal levels; and a comparator (see figs. 1, 6 element 136 and col.5, lines 62-67 and col.6, lines 2-35 and col.8; lines 28-60) that identifies the transmitted message by comparing the received signal with the generated constellation design and that generates an output signal representative of the transmitted message.

As per claim 21, Morgan et al teaches method of identifying a message based upon a received signal, the method comprising: receiving the signal (see col.2, line 30),

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providing a minimum threshold and a maximum threshold representing a range for each of a plurality of possible message levels (see figs. 1, 6 element 120 and 280 and col.6, lines 6-15 and col.9, lines 2-20), wherein the sizes of the ranges are different for at least two of the message levels, and identifying the message by comparing (see figs. 1, 6 element 136 and col.5, lines 62-67 and col.6, lines 2-35 and col.8, lines 28-60) the received signal with the generated minimum and maximum thresholds.

As per claim 22, Morgan et al inherently includes wherein the minimum and maximum thresholds are generated as a function of an interrelationship between noise and the message level.

As per claim 23, Morgan et al inherently includes wherein the minimum and maximum thresholds are generated as a function of the interrelationship between digital impairment and the message level.

As per claim 24, Morgan et al inherently includes wherein the minimum and maximum thresholds are generated as a function of the interrelationship between coherent noise and the message level.

As per claims 37, 42, 47 Morgan et al teaches a receiver for identifying a message based upon a received signal, the receiver comprising: a processor that generates a minimum threshold and a maximum threshold representing a variable range for each of a plurality of possible message levels in a single constellation design (see figs. 1, 6 element 120 and 280 and col.6, lines 6-15 and col.9, lines 2-20); a comparator (see figs. 1, 6 element 136 and col.5, lines 62-67 and col.6, lines 2-35 and col.8, lines 28-60) that identifies the message by comparing the received signal with the

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generated minimum and maximum thresholds, wherein the minimum and maximum thresholds are a function of an inter-relationship between noise and the message level.

As per claim 49, Morgan et al inherently includes wherein the distances  $d(i)$  are different for at least two different pairs of message levels.

As per claim 50, Morgan et al inherently includes further comprising the step of generating the minimum and maximum thresholds using transmitted training signals.

As per claim 51, Morgan et al inherently includes wherein the step of adjusting comprises removing from the constellation design a message level that gives rise to  $d(i) \times d_{min}$ .

As per claim 52, Morgan et al inherently includes wherein the sizes of the ranges are different for at least two of the message levels.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 9-10, 28, 30-31, 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan et al U.S. patent No 5,476,488 in view of Bakke et al U.S. Patent No 5,621,766.

As per claims 9 and 28, Morgan et al teaches all the features of the claimed invention except i means for determining a distance  $d(I)$  between received signal levels, the distance  $d(I)$  having different values for a plurality of message levels.

Bakke et al teaches means for determining a distance  $d(I)$  between received signal levels, the distance  $d(I)$  having different values for a plurality of message levels (see fig.4 element 270).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Bakke into Morgan as to determine a leading edge of the burst based on an average of the time of the maximum and of the minimum as taught by Bakke (see col.4, lines 38-42).

As per claim 10, Morgan et al method of forming a constellation design having a selected number of message levels, the constellation design forming part of a receiver that identifies a transmitted message based upon a received signal, the method comprising: determining a minimum threshold and a maximum threshold representing a range for each of a plurality of possible signal levels (see figs. 1, 6 element 120 and 280 and col.6, lines 6-15 and col.9, lines 2-20), wherein the sizes of the ranges are different for at least two of the message levels.

However Morgan et al does not teach calculating the distance  $d(I)$  between the maximum threshold for possible signal level  $(I)$  and the minimum threshold for possible signal level  $(i+1)$ .

Bakke et al teaches means for determining a distance  $d(l)$  between received signal levels, the distance  $d(l)$  having different values for a plurality of message levels (see fig.4 element 270).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Bakke into Morgan as to determine a leading edge of the burst based on an average of the time of the maximum and of the minimum as taught by Bakke (see col.4, lines 38-42).

As per claim 30-31, Morgan and Bakke in combination would teach the step of identifying whether the calculated distance  $d(l) > d_{min}$ , wherein  $d_{min}$  represents a selected minimum value as to determine a leading edge of the burst based on an average of the time of the maximum and of the minimum as taught by Bakke (see col.4, lines 38-42).

As per claim 45, Bakke et al teaches determining a distance  $d(l)$  (see fig.4 element 270 and col.4, lines 35-55) between received signal levels, the distance  $d(l)$  having different values for a plurality of message levels, and identifying whether the determined distance  $d(l) > d_{min}$ , wherein  $d_{min}$  represents a selected minimum value (see col.4, lines 14-16 and col.6, lines 65-67). Furthermore implementing such teaching into Moran would have been obvious to one skilled in the art as to determine a leading edge of the burst based on an average of the time of the maximum and of the minimum as taught by Bakke (see col.4, lines 38-42).



***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 5, 11-12, 32-33, 38-39 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan et al U.S. patent No 5,746,488 in view of Lane U.S. patent No 5,380,450.

As per claims 5, 11 and 32, Morgan et al teaches all the features of the claimed invention except generating the minimum and maximum thresholds define a range wherein the probability of correctly receiving a selected signal exceeds a selected probability  $P_0$ .

Lane teaches analyzing the probability density function wherein the minimum and maximum thresholds define a range wherein the probability of correctly receiving a selected signal exceeds a selected probability  $P_0$  (see abstract and figs. 2-4).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Lane into Morgan et al as to determine the constellation size of a QAM signal without requiring a priori carrier lock before accomplishing such a determination as taught by Lane (see abstract).

As per claims 12 and 33, Morgan et al teaches transmitting data points to the receiver and recording the received signal (see fig.1 col.4, lines 51-65). Furthermore implementing such teaching for identifying the probability density function would have

been obvious to one skilled in the art as to determine the constellation size of a QAM signal without requiring a priori carrier lock before accomplishing such a determination as taught by Lane (see abstract).

As per claims 38 and 46, Morgan et al teaches all the features of the claimed invention except wherein the minimum and maximum thresholds define a range wherein a probability of correctly receiving a selected signal exceeds a selected probability  $P_0$ .

Lane teaches analyzing the probability density function wherein the minimum and maximum thresholds define a range wherein the probability of correctly receiving a selected signal exceeds a selected probability  $P_0$  (see abstract and figs. 2-4).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Lane into Morgan as to determine the constellation size of a QAM signal without requiring a priori carrier lock before accomplishing such a determination as taught by Lane (see abstract).

As per claim 39, Morgan et al teaches all the features of the claimed invention except wherein the determining step comprises the steps of: identifying a probability density function for each possible signal level  $Y$ , and identifying the minimum and maximum thresholds as the boundaries of a range in the identified probability density function wherein the probability of correctly receiving a selected message level exceeds a selected probability  $P_0$ .

Lane teaches identifying a probability density function for each possible signal level  $Y$ , and identifying the minimum and maximum thresholds as the boundaries of a range in the identified probability density function wherein the probability of correctly

receiving a selected message level exceeds a selected probability  $P_0$  (see abstract and figs. 2-4).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Lane into Morgan as to determine the constellation size of a QAM signal without requiring a priori carrier lock before accomplishing such a determination as taught by Lane (see abstract).

### ***Response to Arguments***

3. Applicant's arguments filed 8/18/05 have been fully considered but they are not persuasive. In page 10, paragraph 1, of the response applicant asserts that Morgan does not teach "wherein the sizes of the ranges are different for at least two of the message levels and that the "Tmax and Tmin" of Morgan have the same range. Examiner respectfully disagrees. There is no passage in the Morgan reference that explicitly teaches "Tmax and Tmin" have the same range. Applicant is reminded that Examiner is entitled to the broadest interpretation of the claims therefore applicant's arguments are moot and this case is made final.

4. In page 11, of the response applicant asserts that Lane does not teach message levels having different sizes. Examiner respectfully disagrees. In fact Lane teaches number of bins having different constellations sizes (see col.3, lines 30-40 and col.6, line 10-20). Applicant relies only in the description on (col.8, lines 12-126) of Lane to assert that the reference fail to teach the claims while ignoring other passage (see col.6, lines 10-20) in the specification that clearly meet the claimed invention. Applicant is

reminded that Examiner is entitled to the broadest interpretation of the claims therefore applicant's arguments are moot and this case is made final.

***Allowable Subject Matter***

5. Claims 6-8, 13-19, 25-27, 29, 34-36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 40-41 and 43-44 are allowed over the prior art of record.

6. The following is a statement of reasons for the indication of allowable subject matter: a means for calculating the mean value,  $\text{Lev}(l)$ , within a selected range defined by a selected set of minimum and maximum thresholds as recited in claims 6, 13, 17, 34, 40-41, 44. Calculating a variable range  $\text{Lmse}(l)$  for each possible message level,  $\text{Lmse}(l)$  representing one-half the distance between the minimum and the maximum thresholds for each possible message level as recited in claims 25, 43.

***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

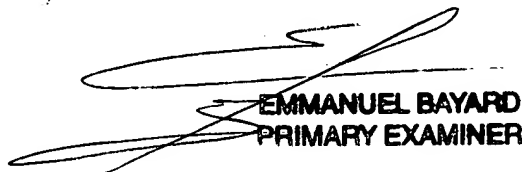
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is 571 272 3016. The examiner can normally be reached on Monday-Friday (7:Am-4:30PM) Alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vanderpuye Kenneth can be reached on 571 272 3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Emmanuel Bayard  
Primary Examiner  
Art Unit 2638

10/20/05



EMMANUEL BAYARD  
PRIMARY EXAMINER